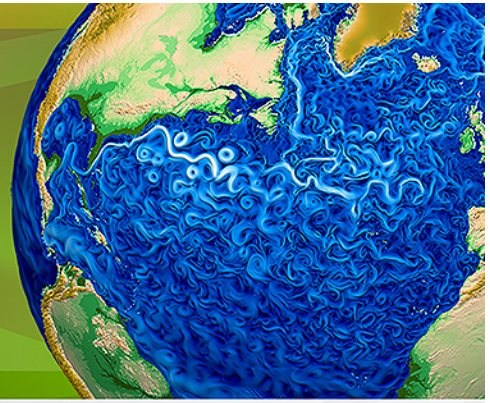
ACME
Accelerated Climate Modeling for Energy



Project Management Strategy

Renata McCoy, Ph.D.
ACME Project Engineer
LLNL

Overview

- ACME Communication
  - Confluence Wiki

    eliminated the need for email lists and Google docs, provided one-stop shop for all communication, documentations and discussions, great notifications, fosters transparency, huge success
  - Confluence Calendar – integrated part of the wiki
  - JIRA online task tracking integrated with Confluence
  - GoToMeeting - screen sharing conferencing
- ACME agile development philosophy and tight integration
  - Long term to 6 months plan (AL) -> short term (Q) plans (GL) -> JIRA planning tasks (GL/TL) -> JIRA sprints (TL) -> Quarterly Reports (TL/GL)-> Rebase Plans (AL) and Repeat

    (GL: Group Leaders, TL – Task Leaders, AL – ACME Leadership)
- What's the thinking behind this strategy
  - Planning with agility, easy reaction to changes, confluence for documentation and report, JIRA 2 weeks focused planning and tasks definition for all, rebase to adjust to changing conditions

Project Management Agile Methodology

Agile project management adopted in ACME

- Continuous improvement
  - Iterative and incremental planning
  - Flexible realization, task teams oriented
  - Accountability for deliverables at quarterly intervals
  - Retrospective, and improvement to planning
- Rapid development through
  - Short living tasks (2 to 6 weeks)
- Requiring a deliverable
  - Every task has a deliverable
    - code, documentation, design plan doc, journal article, published data, diagnostic test webpage
- Small development task teams with designated task leader
  - ACME organization is structured around tasks
- Task tracking online software – JIRA, provides
  - Focused planning
  - Transparency
  - Automated reporting
  - Project oversight
  - Dashboards overviews

Communication - Confluence

- Project Communication – Confluence
  - Internal Wiki Website
  - Meetings
  - Reports
  - Blogs/Comments/Discussions
  - Documentation
  - Calendars
  - Notifications

Confluence - Meeting Notes Example

2014-07-24 Council Telecon

Date

24 Jul 2014

7:00 am PDT, 8 am MDT, 9 am CDT, 10 am EDT

Attendees

- David C. Bader
- Phil Jones
- Phil Rasch
- Renata McCoy
- Dean N. Williams
- Renata McCoy
- Dean N. Williams
- Mark Taylor

Access Information

- 1-866-914-3976 (int'l +1-925-424-8105) Conf ID 951469#

If there is time, Other suggested items for discussion

- (Phil Rasch) Peter Caldwell and I would like guidance about "naming conventions/Version numbers for the model"

Discussion items

Time	Item	Who	Notes
5 minutes	Project Plan and press release	Bader	Project plan is posted on "ACME Documentation" space on the "Proposals and Plan" page. https://acme-climate.atlassian.net/wiki/download/attachments/2523821/ProgramPlanv8.pdf?api=v2 A press release is being prepared. Bader will route press release to ACME Lab POC's for routing to their various public affairs offices;
10 minutes	Change Meeting Schedule	Bader	• Proposal from Bader/Koch to change Council Telecons to Bi-weekly with one of those calls each month including task team co-leads. On alternate weeks, Exec Committee will hold 30 minute telecons with the leads/co-leads for each Task Team. We agreed to move to this format and move the Thursday Council Telecons to every other Thursday at 8 am PT, 11 am ET starting July 31.
10 minutes	Report from Task Team leads - Exec Committee Telecons	Bader	
25 Minutes	JIRA Requirements	Renata	Renata gave update on JIRA status and solicit requirements for initial JIRA implementation, see the blog JIRA Setup and Implementation Requirements. Comments should be posted on that page.
5 minutes	Deep Dive proposals	Bader	See attached proposals (click on the paper clip at the top of this page). Comments on Deep Dive proposals should be made in the comments section on this page. Council will act on proposals at next meeting.
5 minutes	Code naming and versioning conventions	Rasch	Phil R. brought up that this is a still an unresolved problem. Mark will take the lead and will develop a solution following a telecon with the Task Team Leads and Co-leads.

Action items

implement code versioning and naming conventions Mark Taylor 15 Aug 2014

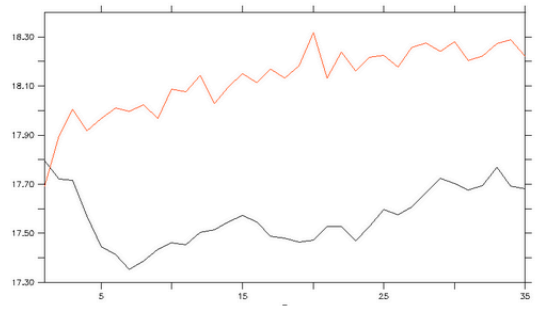
ACME Accelerated Climate Modeling for Energy

Confluence - Comments Example

ACME Accelerated Climate Modeling for Energy

Mathew Maltrud

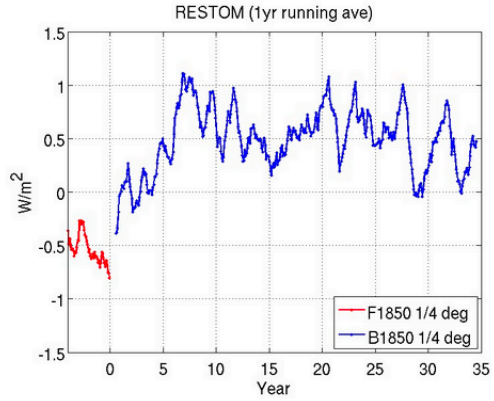
here's a time series plot of the annual average global SST from the CAM4-SE run (red) and CAM5-SE (black). note for the CAM5 run, the initial drop in SST is due to starting with a negative top of atmosphere balance. unlike the CAM4 run, where the SST increases almost everywhere as time goes on, the CAM5 case has areas of + and - changes. i can also post maps of SST change if anyone wants. in fact, if it is ok with @David C. Bader i will post the short High Res report i wrote a few months ago that covers much of this.



Reply • Edit • Delete • Like • Sep 23, 2014

David C. Bader

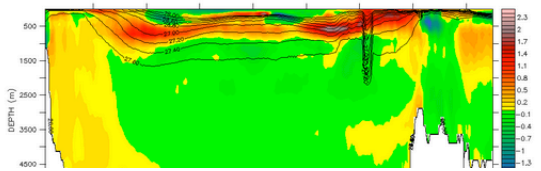
1. @Mathew Maltrud - I'll post the full report once I submit it to Dorothy. I am 3 months late, but she should have it before we distribute it. In Mat's report, he notes that the TOA imbalance is larger in the CAM4 run than in the CAM5 run.
2. Here is the TOA imbalance to accompany the black SST line in the above figure (copied from last week's meeting page and contributed by @Mark Taylor). This looks consistent with Rich's comment below, assuming the heat is going into the ocean, but we cannot say at what levels.



Reply • Edit • Delete • Like • Mathew Maltrud likes this • Sep 23, 2014

Mathew Maltrud

here's the (global) zonal average of the difference in temperature in year 35 compared to year 1 of the CAM5-SE run. contours are density for year 35 to highlight that the increase at depth occurs primarily in the subtropical mode waters for the upper ~1000m. also, the Antarctic bottom water appears to be warming. ignore the density contours just north of 40N–this is due to the inclusion the Black Sea (relatively fresh).



Confluence - Y1Q1 Report Page Example

Y1Q1TR for Satellite Simulators

Y1Q1 Task Report (TR) for Satellite Simulators

1.Team	Atmosphere
2.Task	Satellite Simulators
3.Task ID	T5
4.Reporter	Yuying Zhang
5.Report Status	DONE
6.Delivered	5 out of 7
7.Schedule	ON SCHEDULE
8.Problems	NO

Summary for this Quarter

In the first quarter we have documented how to run the COSP online diagnostics, including the description of how to use the namelist to control different features and diagnostics in COSP, and what the output fields are. We also have tested the impact of the new precipitation sub-column distribution in COSP on the simulator-derived results, and finished the first draft of the paper to address the sensitivity of the simulated radar reflectivity to this modification. In the meantime, we have identified a bug in COSP and provided a bug fix, and upgraded the offline COSP diagnostics package to version 1.4 which improves the computational efficiency by a factor of three. We have also started to coordinate with NCAR's scientists to upgrade COSP code in CESM. We have also begun a scoping exercise for the development of an aerosol lidar simulator (to be begun in Q2 or beyond).

Tasks Planned

# Task	Big Task / Epic	Task / User Story	Deliverable #	Deliverable Description	Delivered	Priority	Blocked	Problems	Notes
1	COSP Documentation	Provide documentation for ACME members to run COSP online diagnostics	1	COSP documentation	Yes	Critical	No	No	
2	New precipitation sub-column treatment in COSP	Modify the precipitation sub-column treatment in COSP	2	New COSP precipitation sub-column code	Yes	Critical	No	No	
		Evaluate the effect of the new precipitation sub-column treatment	3	First draft of a paper documenting the results	Yes	Major	No	No	

Tasks Added

# Task	Big Task / Epic	Task / User Story	Deliverable #	Deliverable Description	Delivered	Priority	Blocked	Problems	Notes
1	Offline COSP version upgrade	The offline COSP code package for CAM5 has been upgraded to version 1.4, which runs 3 times faster than the previous version.	4	COSP v1.4 for CAM5.	Yes	Major	No	No	
2	COSP bug fix	We Identified a bug in COSP in CAM, and provided a bug fix. This bug results in 15% overestimation of LWP and underestimation of effective radius.	5	Bug fix	Yes	Critical	No	No	
3	Scoping exercise for aerosol lidar simulator	Identify needed algorithms for an aerosol lidar simulator (Po-Lun Ma). Begun in Q1, completed in Q2	6	description of algorithm	No	Major	No	No	

ACME Accelerated Climate Modeling for Energy

Confluence - Notifications

[Confluence] Software Engineering/Coupler Group > Outputting Namelist variable values

Mark Taylor (Confluence)

Sent: Fri, Jan 16, 2015 at 3:47 PM

To: renata@llnl.gov

Show all 2 Preview All

Mark Taylor **commented** on a page

Re: Outputting Namelist variable values

In CAM, it would require a bit of coding to write them out at the end of the run: since the dozens of namelists are all private module data. We could make an end_of_run() function in every module that could be called at the end of the run, or we could make all the namelists public/global variables, so that they could be accessed from an I/O routine that was called at the end of the run.

If you write them out as soon as the code has finished messing with them, then you still have the problem that the next subroutine called could change a namelist parameter. It may not even know that the parameter it was changing happened to be from a namelist.

Reply • Like

In reply to

Philip Cameron-Smith

I agree nothing is perfect.

I don't see any reason with #1 or #2 why the namelists would need to be written out in a single routine – I presume you could just add a write_namelist statement each time it seems that the code has finished messing with one of the namelists.

I also don't see any reason why the output has to be done at the start of the run – I presume it could be done at the end of the run.

Stop watching space • Manage notifications

[Confluence] Software Engineering/Coupler Group > Y1

Robert Jacob (Confluence)

Sent: Thu, Jan 15, 2015 at 7:09 PM

To: renata@llnl.gov

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2. **Testing (@Robert Jacob) (T7b)**
    1. **Complete configuration table**
        1. Get 2 cases to run on Titan with Intel
        2. Get 2 cases to run on Titan with Cray
        3. Get 2 cases to run on Lawerencium
        4. Get I case to run on Wolf
        5. Confirm Mac laptop runs something
        6. Get I case to run on OIC
        7. Get 2 cases to run on Sooty and Olympus.
    2. **Jenkins Testing (@James Foucar)**
        1. Redsky and melvin need to consistently pass
        2. Need JenkinsSON+JenkinsSRN results in publicly viewable mirror
        3. Resolve "opening up" of our Jenkins system to outside-of-Sandia developers
        4. Need better dashboard
        5. Need to determine when to test master vs. next
        6. Separate and limit testing that must be done on clusters
        7. Add more clusters (outside of Sandia) to Jenkins slave pool

    ~~**Confirm/improve scientific content of system tests**~~
    3. Manual Testing
        1. Port ACME integration and developer suites to Cascade-nag
        2. Port ACME integration and developer suites to Edison
        3. Port ACME developer suite to Blues
        4. Port ACME developer suite to Lawerencium
        5. Port ACME developer suite to Mustang and Wolf
        6. Port ACME developer suite to Cascade-intel
        7. Port ACME developer suite to Olympus, Sooty
    4. **Extend system tests**
        1. add land model tests
        2. add atmosphere model tests

    ~~**Complete configuration table**~~
        1. add LCF specific test suites?

New edit

Last modified by Mark Taylor Reload

Isn't the science output linked to the provenance data in some way? So you could retrieve them?

In any case, yes you could do both and #1 would be the easiest to implement quickly.

Reply • Edit • Delete • Like • about 6 hours ago

Philip Cameron-Smith

For Suggestion #2, would the namelist information be stored in all the output streams (h0, h1, ...) ?

Reply • Edit • Delete • Like • about 6 hours ago

Doug Jacobsen

It would depend largely on how to model implemented it, but that is how we do it in MPAS. No matter what you do, every output stream gets all namelist parameters.

Reply • Edit • Delete • Like • about 6 hours ago

Robert Jacob

@Dali Wang or @Forrest Hoffman, what does the land model do for recording namelist variable values?

Reply • Edit • Delete • Like • about 6 hours ago

Doug Jacobsen

Suggestion #3 doesn't necessarily give us the information we need for provenance. For example, if a user_nl_cam file is used to modify the cam namelist options, that's not captured through the namelist_defaults and namelist_definition files.

Reply • Edit • Delete • Like • 18 minutes ago

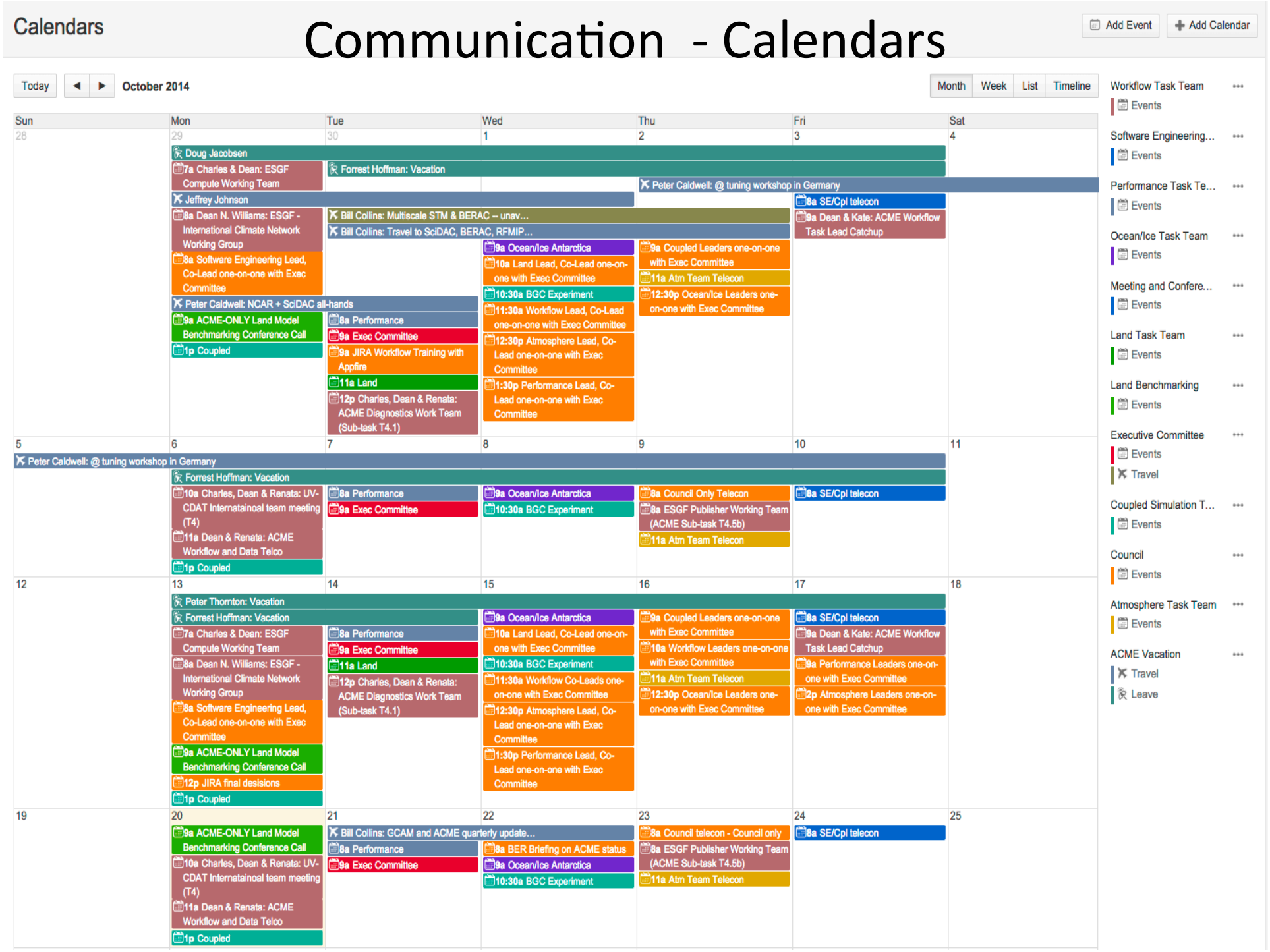
Mark Taylor

For suggestion #3 - the provenance is the namelists, not the xml files. So user_nl_cam, namelist_defaults.xml and namelist *definition.xml are all parsed to produce "atm_in"*, which then has the full provenance of the simulation.

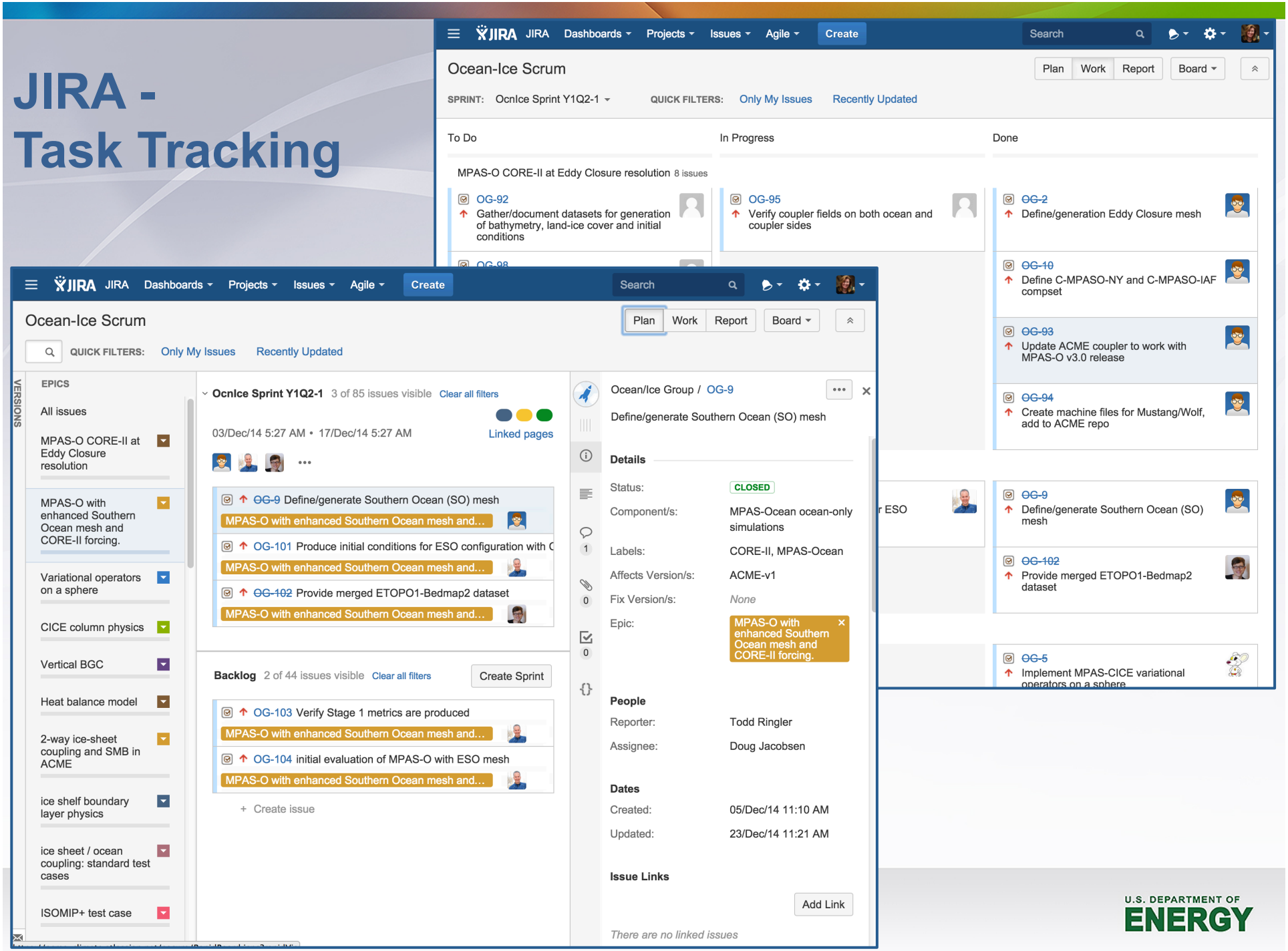
#3 and #1 are very similar: Both only cover variables that appear in namelists. Both require coding discipline (either ensuring all Fortran namelists have associated write statements, or ensuring all namelists variables appear in namelist_defaults.xml). For #3, i see the drawback is that the namelists are not sorted nor do they have a common format. But #3 is 99% done and should be easier to implement than #1.

Reply • Edit • Delete • Like • 43 minutes ago

Communication - Calendars



JIRA - Task Tracking



U.S. DEPARTMENT OF ENERGY

JIRA - Task Tracking

Filter for Ocean-Ice Scrum Save as Details ☆

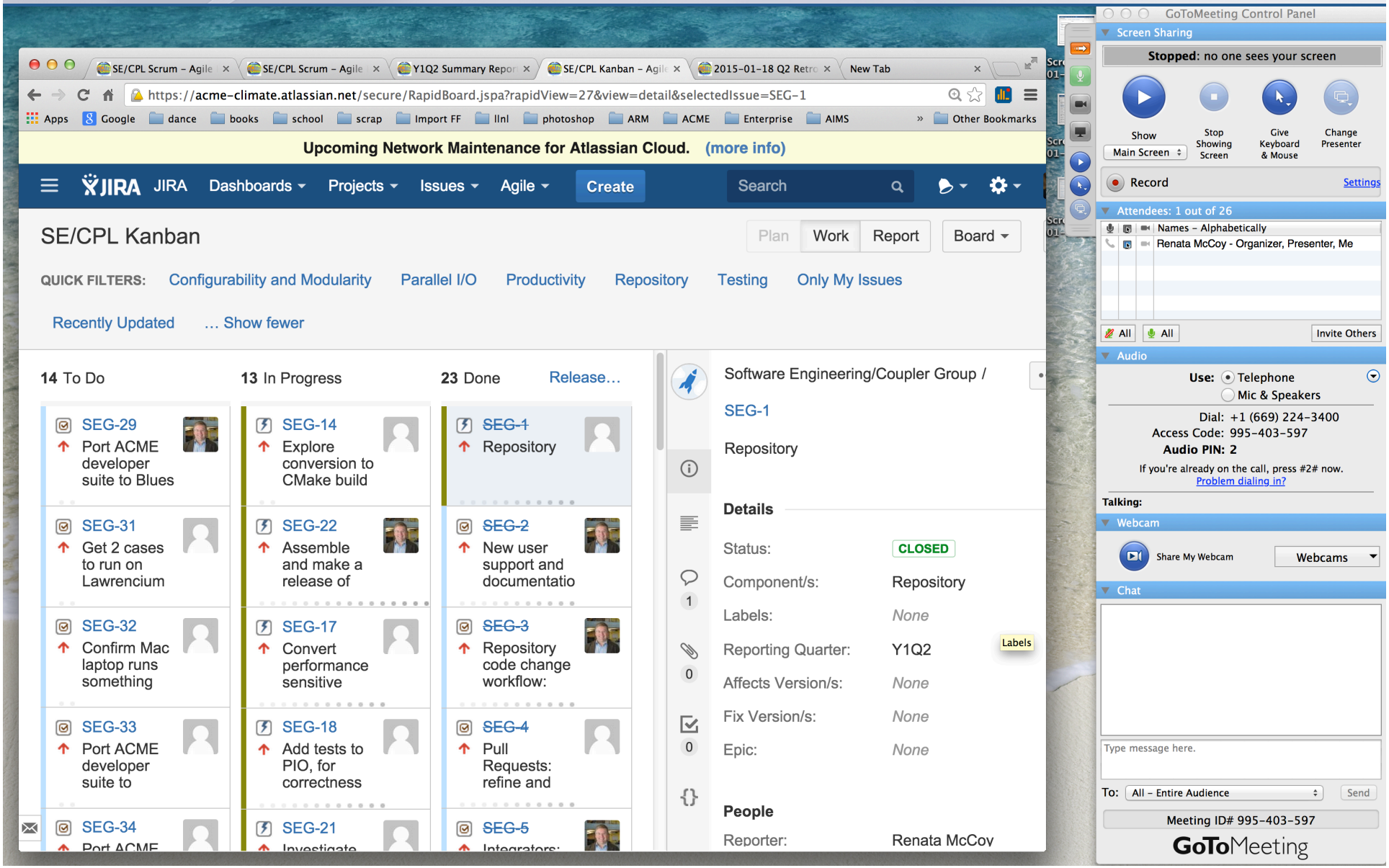
project = "Ocean/Ice Group" ORDER BY Rank ASC

1–50 of 158

T	Key	Summary	Assignee	P	Status	Updated	Due	Components	Description	Flagged	Labels	Links	S
	OG-62	au	Matt Hoffman	↑	OPEN	18/Dec/14	31/Dec/14	MPAS Antarctic Land Ice Model			MPAS-LandIce testing		
	OG-1	The initial of spin-up of MPAS-O at Eddy Closure (EC) resolution with CORE-II forcing.	Mark Petersen	↑	OPEN	10/Dec/14	31/Dec/14	MPAS-Ocean ocean-only simulations	This work will include the first spin-up of MPAS-O using CORE-II forcing. This is primarily a "shake down" exercise to insure that coupling of MPAS-O to the rest of the ACME system is correct. Biases will be diagnosed and integrations will be repeated in out quarters.		CORE-II MPAS-Ocean		
	OG-2	Define/generation Eddy Closure mesh	Doug Jacobsen	↑	CLOSED	10/Dec/14	03/Dec/14	MPAS-Ocean ocean-only simulations	Generate the files necessary to run MPAS-O at "low resolution" with CORE-II forcing.		MPAS-Ocean		
	OG-3	The initial of spin-up of MPAS-O using enhanced Southern Ocean mesh and CORE-II forcing.	Todd Ringler	↑	OPEN	10/Dec/14	31/Dec/14	MPAS-Ocean ocean-only simulations	This work includes an initial configuration of MPAS-O using a mesh with enhanced resolution in the Southern Ocean.		CORE-II MPAS-Ocean		
	OG-4	Variational operators	Adrian Turner	↑	CLOSED	05/Jan/15	24/Dec/14	MPAS-CICE			MPAS-CICE		
	OG-7	Refactor CICE column physics	Elizabeth Hunke	↑	OPEN	04/Dec/14	24/Dec/14	MPAS-CICE			MPAS-CICE		
	OG-5	Implement MPAS-CICE variational operators on a sphere	Adrian Turner	↑	CLOSED	10/Dec/14	10/Dec/14	MPAS-CICE			MPAS-CICE		
	OG-9	Define/generate Southern Ocean (SO) mesh	Doug Jacobsen	↑	CLOSED	23/Dec/14	16/Dec/14	MPAS-Ocean ocean-only simulations	Develop mesh and associated input files to run MPAS-O with enhanced resolution in the Southern Ocean.		CORE-II MPAS-Ocean		
	OG-8	Refactor CICE column physics	Elizabeth Hunke	↑	CLOSED	22/Dec/14	24/Dec/14	MPAS-CICE	Steps: Remove horizontal loops from column package Split code and/or pass variables through subroutine interfaces Rewrite/isolate variables internal to column package Create new module with column physics interfaces		MPAS-CICE		
	OG-6	Compare MPAS-CICE variational operator on sphere to analytical solution	Adrian Turner	↑	CLOSED	18/Dec/14	24/Dec/14	MPAS-CICE			MPAS-CICE		
	OG-79	Test global vertical BGC offline	Scott Elliott	↑	IN PROGRESS	16/Jan/15	30/Jan/15	Sea ice biogeochemistry			biogeochemistry		
	OG-12	Test vertical BGC offline	Nicole Jeffery	↑	IN PROGRESS	18/Dec/14	24/Dec/14	Sea ice biogeochemistry	This task will eventually end with a manuscript submission, but not by the end of Q2. For a Q2 success measure, I'll complete the simulations of the Weddell Sea and Barrow sites and compare with field data.		biogeochemistry		
	OG-10	Define C-MPASO-NY and C-MPASO-IAF compset	Doug Jacobsen	↑	CLOSED	24/Dec/14	18/Dec/14	MPAS-Ocean ocean-only simulations	Define standard for running ocean-only MPAS-O simulations within ACME.		CORE-II MPAS-Ocean		
	OG-14	design document	William Lipscomb	↑	OPEN	10/Dec/14	31/Dec/14	MPAS Antarctic Land Ice Model	Write design document for heat balance model		MPAS-LandIce		
	OG-15	debug CISM enthalphy model	William Lipscomb	↑	CLOSED	06/Jan/15	31/Dec/14	MPAS Antarctic Land Ice Model	debug new enthalpy modules in CISM		MPAS-LandIce		
	OG-16	column physics module for both enthalpy and temperature balance schemes	William Lipscomb	↑	OPEN	10/Dec/14	31/Dec/14	MPAS Antarctic Land Ice Model	implement column model (both temperature and enthalpy approaches) with MPAS-friendly data structures		MPAS-LandIce		
	OG-17	test column physics model for heat balance	William Lipscomb	↑	OPEN	10/Dec/14	31/Dec/14	MPAS Antarctic Land Ice Model	test column physics modules in CISM		MPAS-LandIce		
	OG-18	translate column physics to MPAS data structures	William Lipscomb	↑	OPEN	10/Dec/14	31/Dec/14	MPAS Antarctic Land Ice Model	translate column physics model to MPAS land ice code / data structures		MPAS-LandIce		
	OG-19	test column physics model for heat balance (in MPAS)	William Lipscomb	↑	OPEN	18/Dec/14	31/Dec/14	MPAS Antarctic Land Ice Model	test column physics heat balance model in MPAS		MPAS-LandIce	OG-59, ~~OG-57~~	

Open the home page

GoToMeeting - conferencing tool

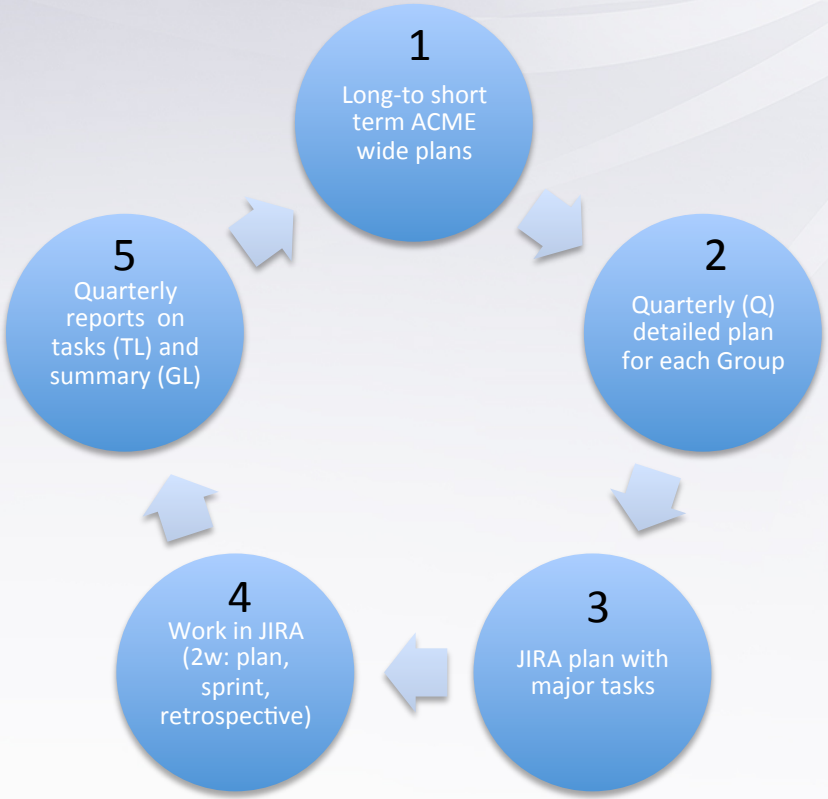


ACME agile philosophy

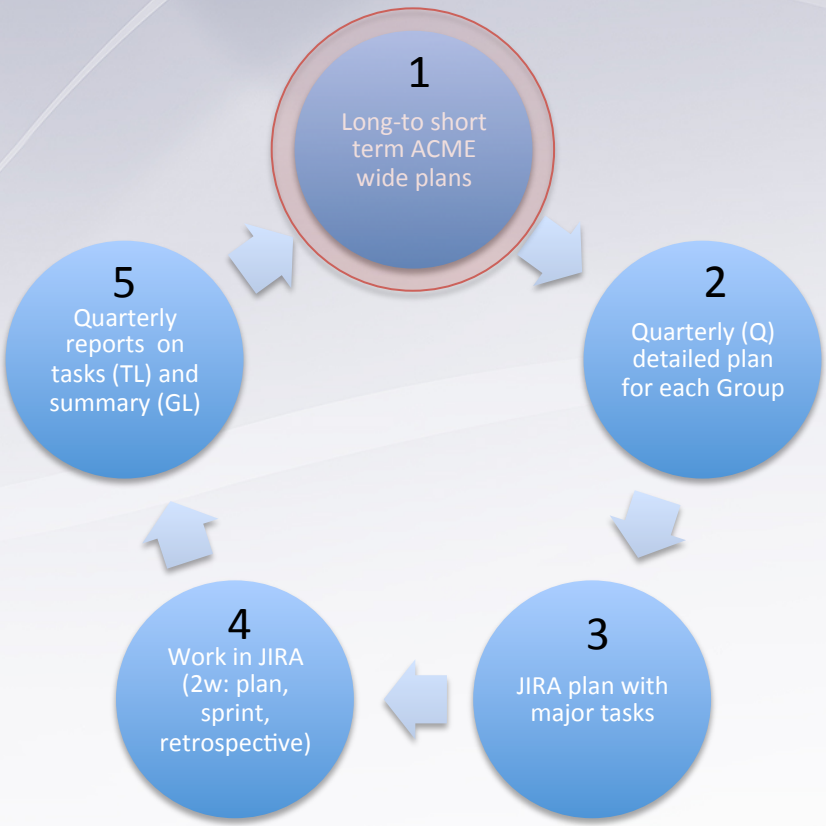
1. Long to short term (10 years, 3 years, 1 year, 6 months) plan (AL)
2. Short term (Q) plans (GL)
3. JIRA plan with major tasks (GL/TL)
4. JIRA sprint/retrospective (TL)
5. Quarterly Reports: Tasks (TL) and Summary by Group Leaders (GL)

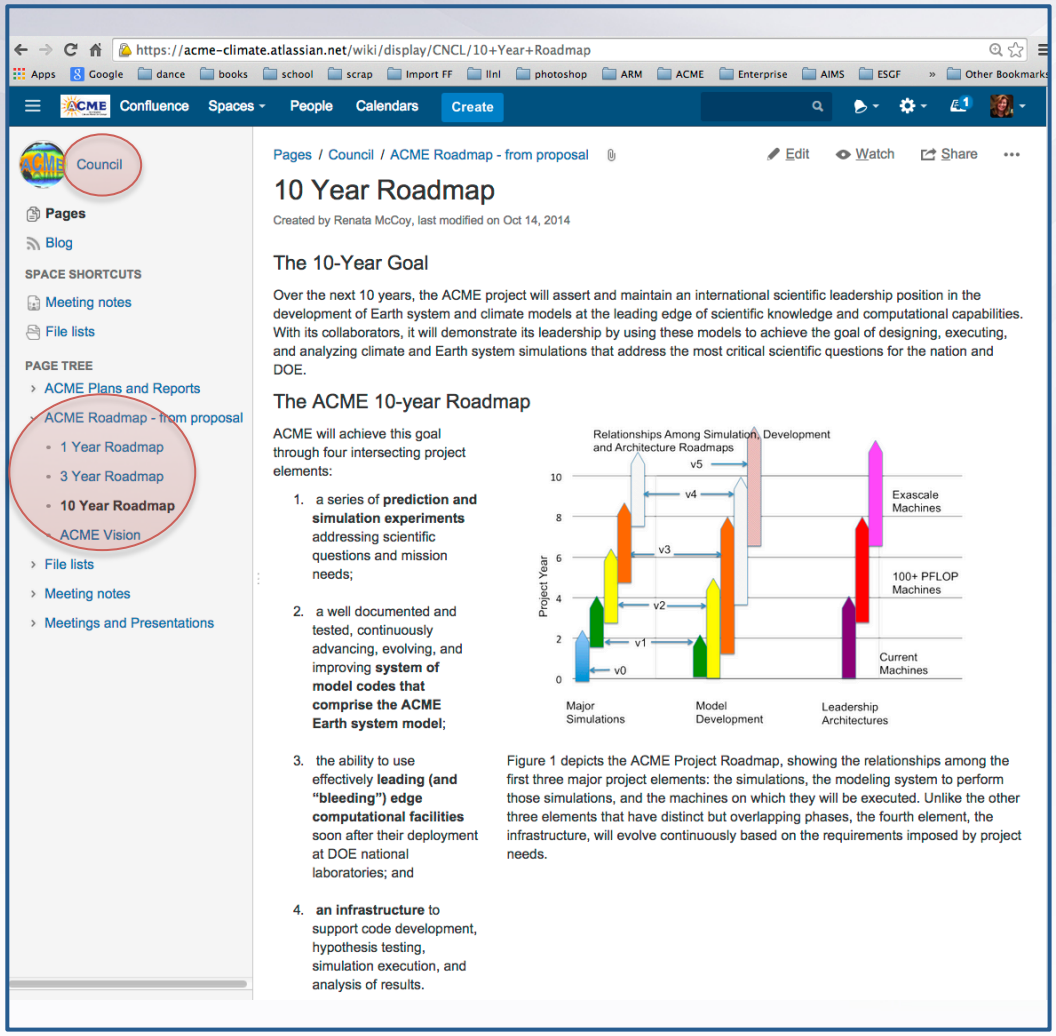
Rebase and Repeat

GL: Group Leaders
TL – Task Leaders
AL – ACME Leadership

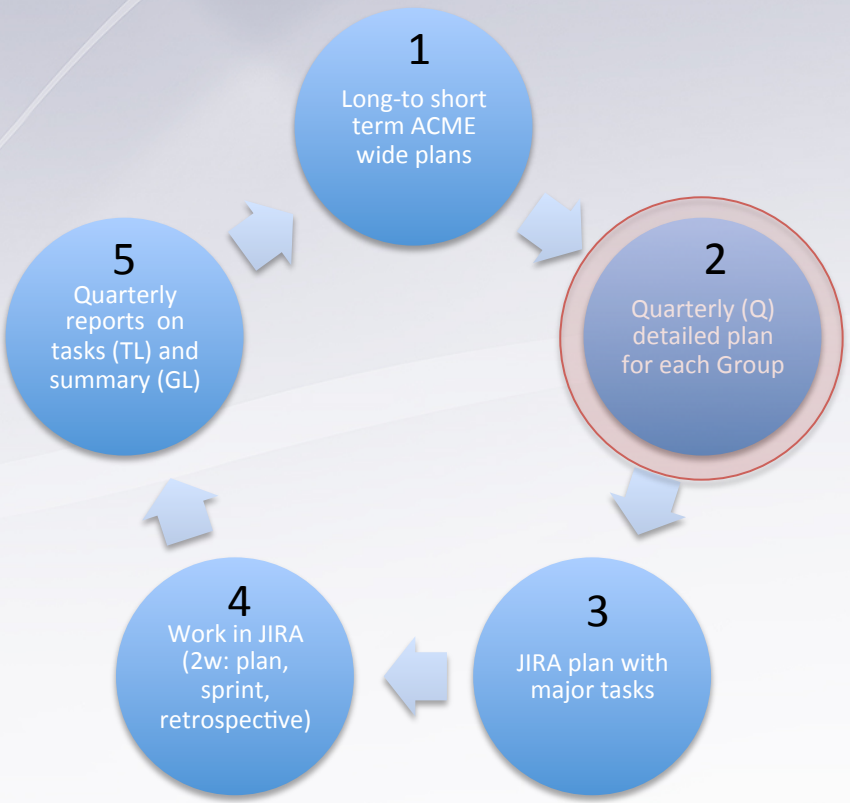


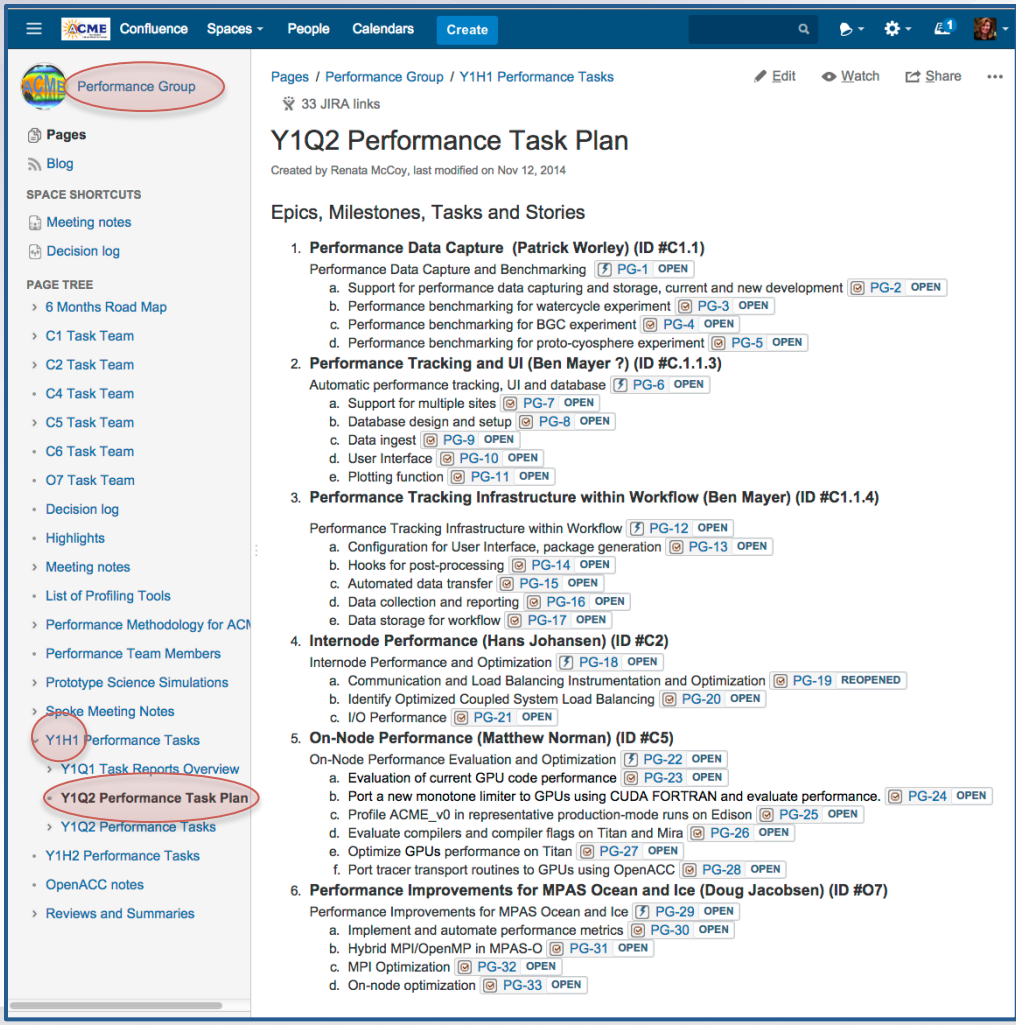
1. Long-to-Short Term ACME Plans



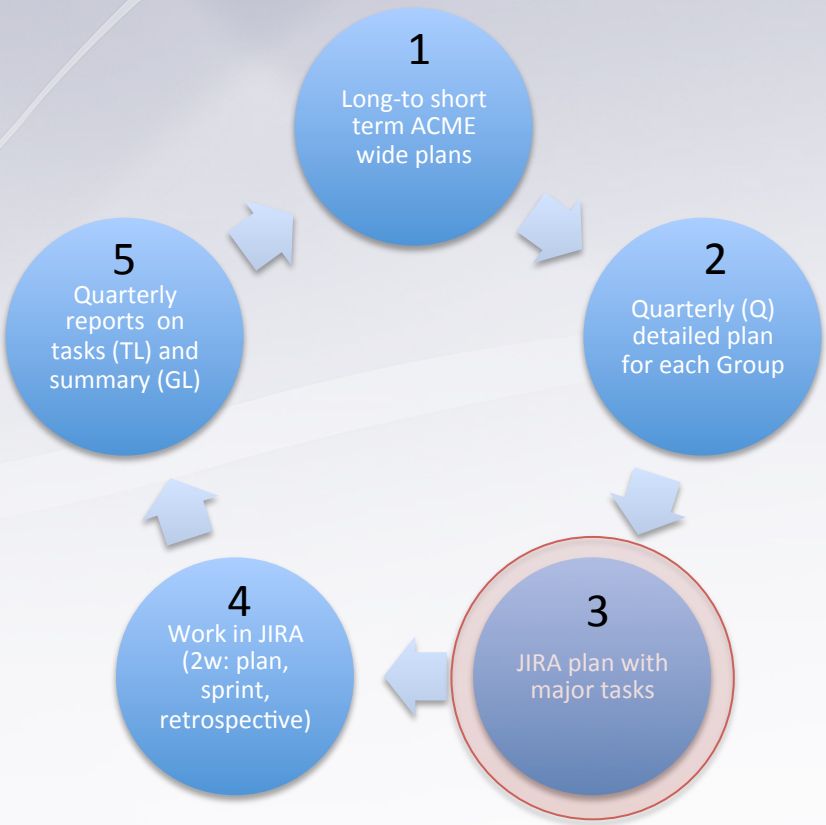


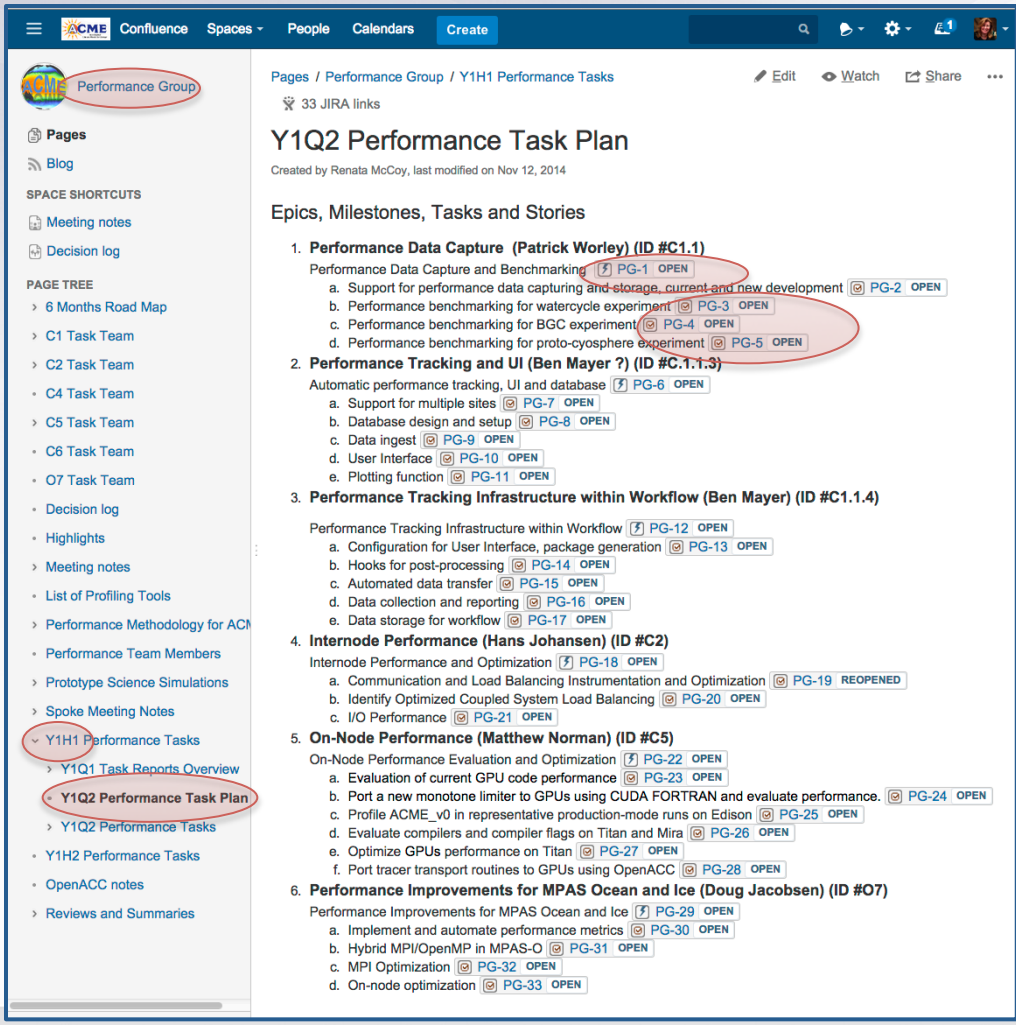
2. Quarterly Detailed Group Plan



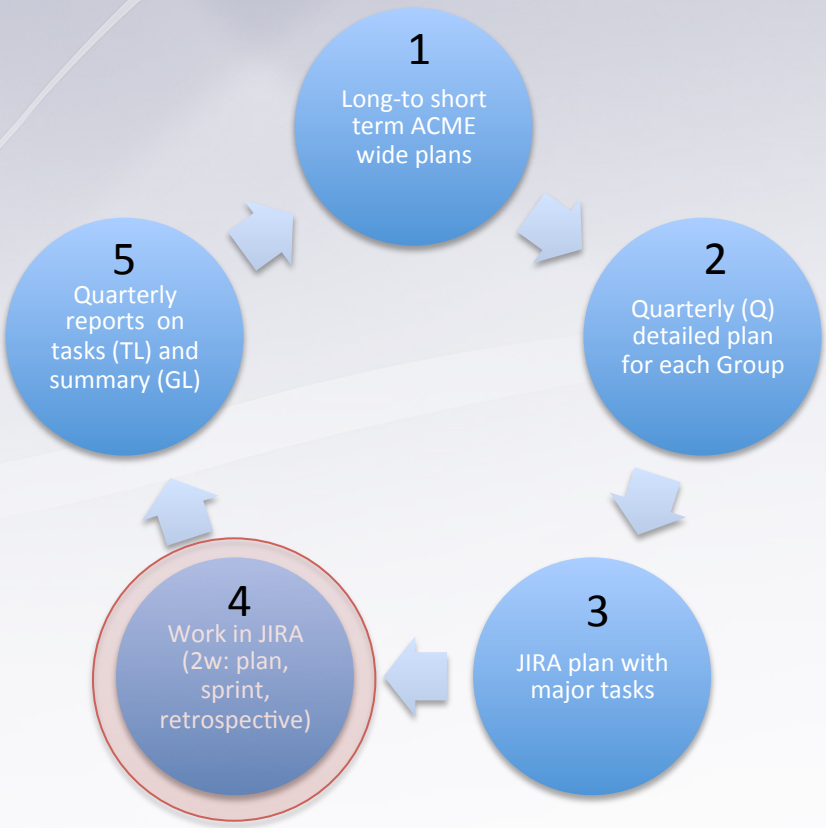


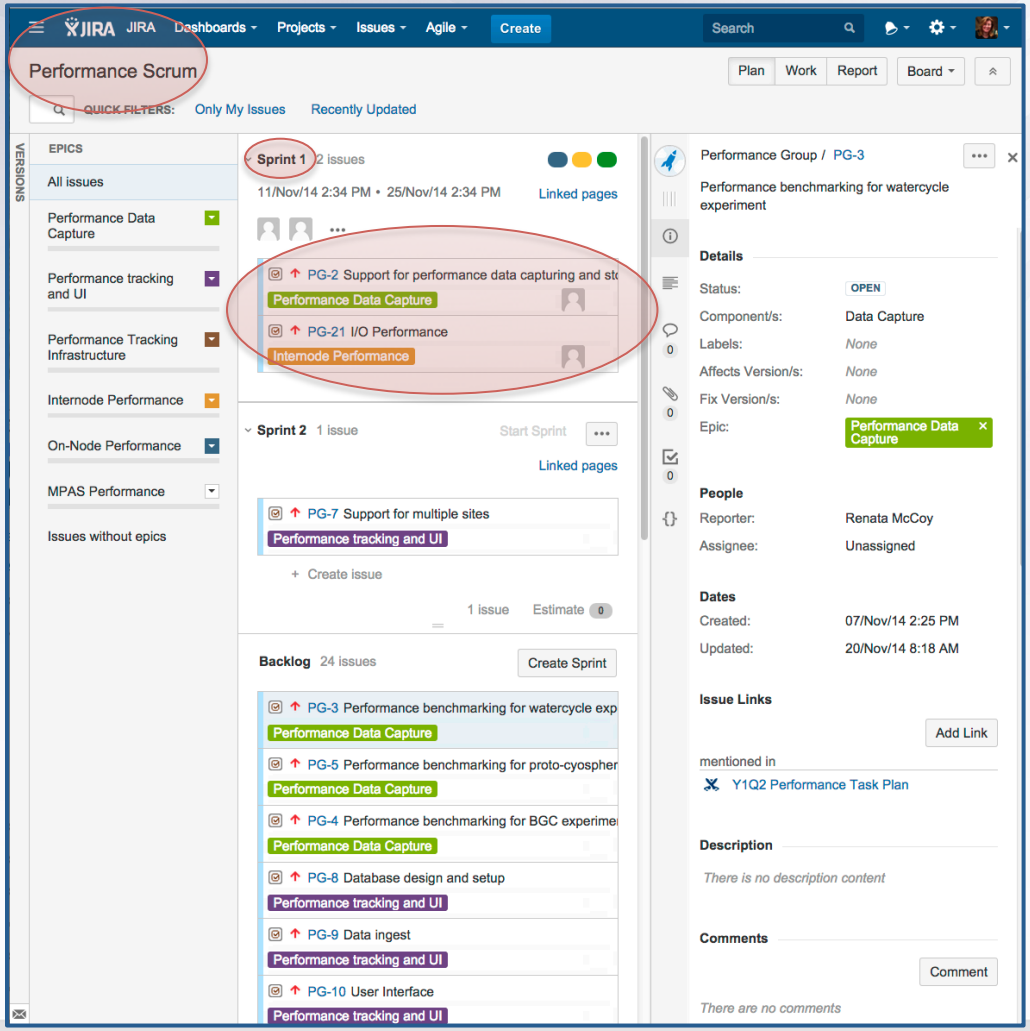
3. JIRA Plan for Major Tasks



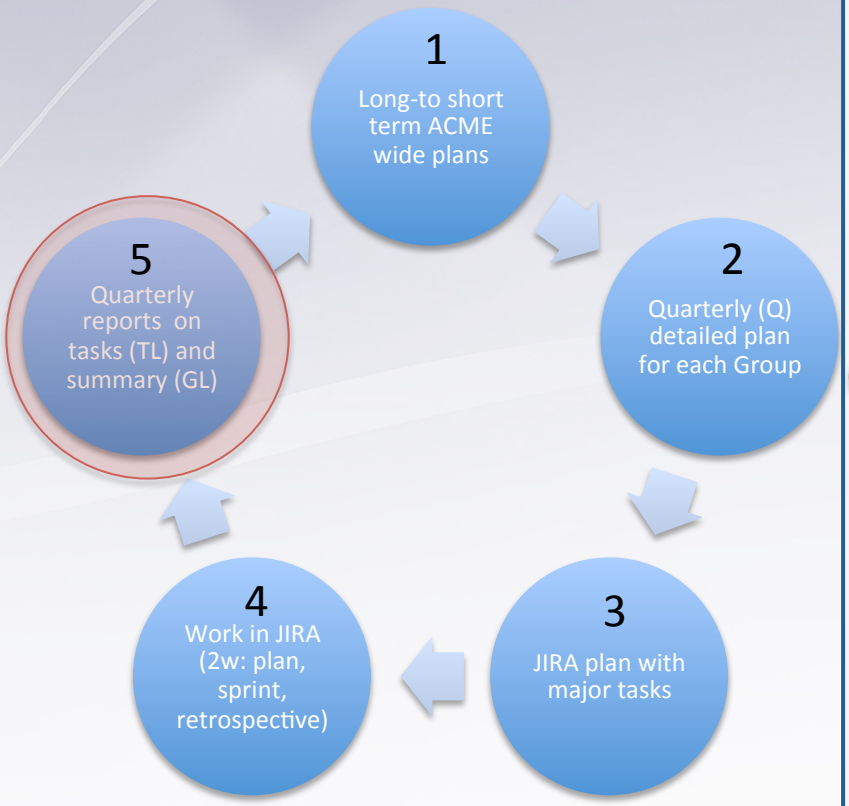


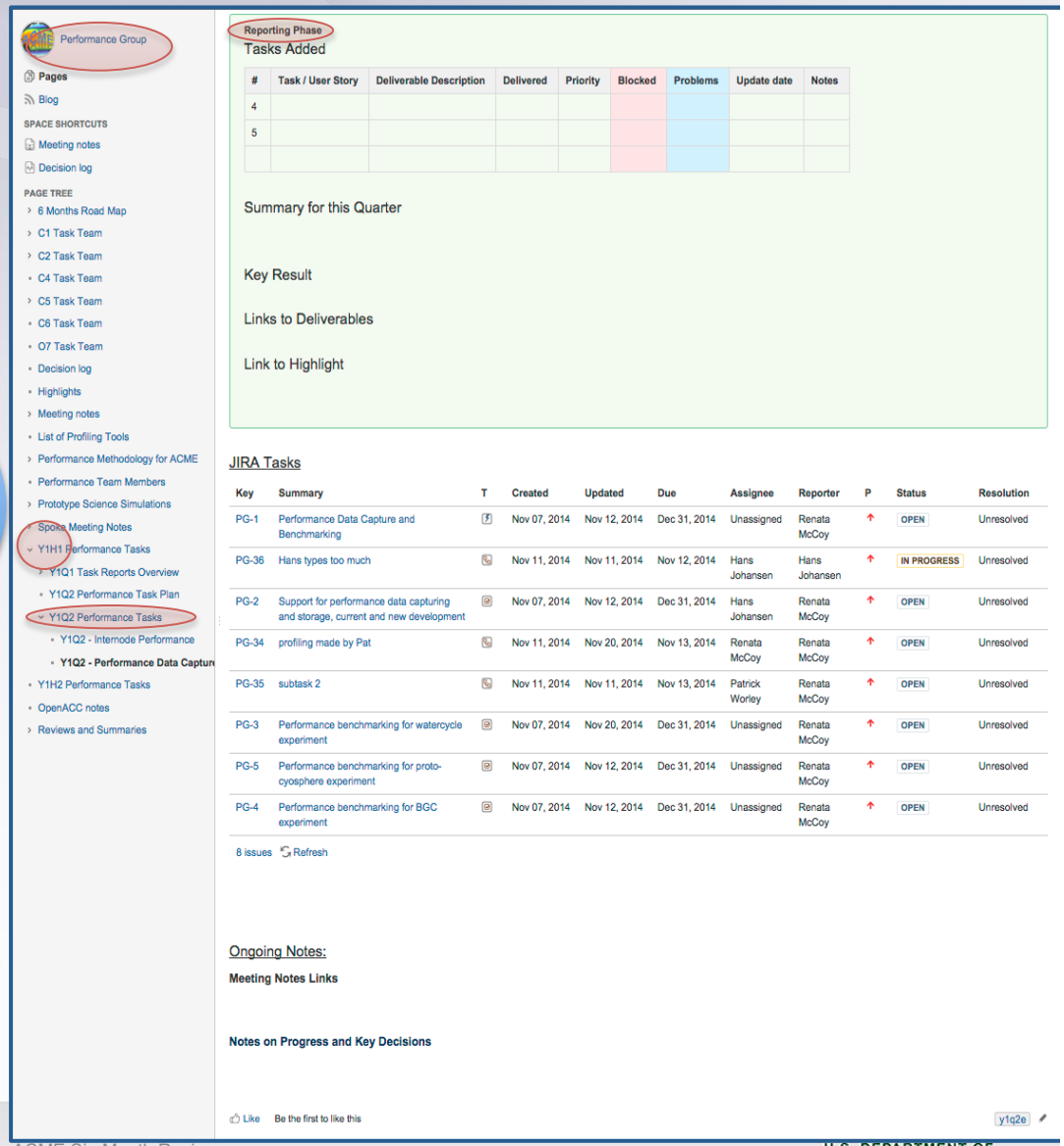
5. JIRA Tasks – 2 Week Sprints





6. Quarterly Reports





Why this structure?

1. Incorporates both planning and agility
2. Enables easy reaction to changes, through rebasing, quarterly planning, sprint planning mode
3. JIRA forces detailed planning for the 2 week long sprints and forces tasks definition for every member of the team
4. By requiring deliverables with each major task, we make sure every task produces a piece of a product
5. The retrospective and rebasing makes sure our plans evolve with changing environment, changing machines, evolution of our knowledge and any other changes.

Summary

- ACME Communication
  - Confluence Wiki
  - Calendar
  - JIRA
  - GoToMeeting
- ACME agile development cycle
  - Long term to 6 months plan (AL) -> short term (Q) plans (GL) -> JIRA plan for tasks (GL/TL) -> JIRA sprints (TL) -> Quarterly Reports (TL) and (GL) -> Repeat from rebased and adjusted plans (AL)

    (GL: Group Leaders, TL – Task Leaders, AL – ACME Leadership)
- Philosophy behind the strategy
  - Agile planning from integrated Road Maps for the ACME mission to the detailed Quarterly planning for each Group, rebased on regular basis, JIRA task tracking with 2 weeks focused planning, Quarterly Reports with deliverables promotes accountability, retrospective and rebase to adjust to changing conditions

Thank You !